INDEX

A

ACHITUV, Y., see O. Levy, 118
ADAMCZEWSKA, AGNIESZKA M., AND STEPHEN MORRIS, Ecology and behavior of *Gecarcoidea natalis*, the Christmas Island red crab, during the annual breeding migration, 305
ADAMCZEWSKA, AGNIESZKA M., AND STEPHEN MORRIS, Metabolic status and respiratory physiology of *Gecarcoidea natalis*, the Christmas Island red crab, during the annual breeding migration, 321
The adaptive bleaching hypothesis: experimental tests of critical assumptions, 51
Aerobic, 59
Aiptasia pallida, 127
Alviniconcha, 298
AMANO, SHIGETOYO, AND ISAO HORI, Metamorphosis of coeloblastula performed by multipotential larval flagellated cells in the calcareous sponge *Leucosolenia laxa*, 20
Anaerobic, 59
Analog VLSI, 243
Anemotaxis, 222
Annelida, 107
Antennae, 1
Artificial neural networks, 195
Asexual reproduction, 107
Audition, 227
Aurelia
  labiata, 92
  limbata, 92
Auditory micromechanics, 190
Axon, 252

B

Balanus amphitrite, 87
BARLOW, ROBERT B., JAMES M. HITT, AND FREDERICK A. DODGE, *Limulus* vision in the marine environment, 169
Barnacle, 87
BARTOL, IAN K., Role of aerobic and anaerobic circular mantle muscle fibers in swimming squid: electromyography, 59
BEER, AMY-JANE, CLAIRE MOSS, AND MICHAEL THORNDYKE, Development of serotonin-like and SALMFamide-like immunoreactivity in the nervous system of the sea urchin *Psammechinus miliaris*, 268
Behavior, 118, 160
  mating, 169
Biological sensor, 190
A biologically inspired controller for hexapod walking: simple solutions by exploiting physical properties, 195
Biomechanics, 1
Biomimetic, 227, 243
  robotics, 160
BIRMINGHAM, J. T., Increasing sensor flexibility through neuromodulation, 206
Bivalve pump, 77
BLAZIS, DIANA E. J., AND FRANK W. GRASSO, Introduction, Invertebrate Sensory Information Processing Workshop, 147
Body plan, 257
BOWMAN, JOHN A. L., see Bernard B. Rees, 247
Brain function, 160
BREITHAUPT, THOMAS, Fan organs of crayfish enhance chemical information flow, 150
BROWNE, KENNETH A., AND RICHARD K. ZIMMER, Controlled field release of a waterborne chemical signal stimulates planktonic larvae to settle, 87
BUCKLAND-NICKS, JOHN, see Ian G. Paterson, 261
Budding, 107

C

Ca^{2+} flux, 344
Calcification, 257
Carausius morosus, 195
Cardiac muscle, 344
Cephalopod, Antarctic, 67
CHADWICK-FURMAN, N. E., see O. Levy, 118
CHAHL, JAVAAN S., see Mandyam V. Srinivasan, 216
Chemical
  communication, 150
  cue, 87
  orientation, 150
  senses, 160, 211
  sensor, 222
Chemoreception, 211
Chemotaxis, 222
Christmas Island, 305, 321
Circadian rhythm, 169
Circular muscle, 59
Clam, giant, 336
Coeloblastula, 20
COFFROTH, MARY ALICE, see Robert A. Kinzie III, 51
COI, 92
Cold adaptation, 67
Communication, chemical, 150
Compound eye, 177
Computer simulation, 195
Constraint, 257
Controlled field release of a waterborne chemical signal stimulates planktonic larvae to settle, 87
Coral, 118
  bleaching, 51
Crab, land, 305, 321
Crayfish, 150, 201
Cricket, 184
Crinoids, 1
CRONIN, THOMAS W., AND JUSTIN MARSHALL, Parallel processing and image analysis in the eyes of mantis shrimps, 177
CRUSE, HOLK, see Josef Schmitz, 195
Crustacean, 211, 305, 321
Cryptic female choice, 261
Cytochrome oxidase *c* subunit I, 92

D

DAWSON, MICHAEL N., AND DAVID K. JACOBS, Molecular evidence for cryptic species of *Aurelia aurita* (Cnidaria, Scyphozoa), 92
Dean, Jeffrey, see Josef Schmitz, 195
Decapod, 281
Dendrite, 252
DERBY, CHARLES D., AND PASCAL STEULLET, Why do animals have so many receptors? The role of multiple chemosensors in animal perception, 211
Development, 257, 268
Development of host- and symbiont-specific monoclonal antibodies and confirmation of the origin of the symbiosome membrane in a cnidarian–dinoflagellate symbiosis, 127

Development of serotonin-like and SALMFamide-like immunoreactivity in the nervous system of the sea urchin *Psammechinus miliaris*, 268
DEVLIN, C. LEAH, 5-Hydroxytryptamine stimulates net Ca^{2+} flux in the ventricular muscle of a mollusc *(Busycon canaliculatum)* during cardioexcitation, 344
DODGE, FREDERICK A., see Robert B. Barlow, 169

E

Echinoderm, 33, 268
Ecology, 305
Ecology and behavior of *Gecarcoidea natalis*, the Christmas Island red crab, during the annual breeding migration, 305
Egg size, 33
Electromyography, 59
Energy
  content, 33
  store, 321
Equilibrium pathways in crustacea, 155
Escape hatches for the clonal offspring of serpulid polychaetes, 107
Estuary, 87
ETNIER, SHELLEY, Flexural and torsional stiffness in multi-jointed biological beams, 1
Evolution of development, 257
Evolutionary novelty, 257
Exercise, 305, 321
Eye, compound, 177

F

Factors controlling the expansion behavior of *Favia favus* (Cnidaria: Scleractinia): effects of light, flow, and planktonic prey, 118
Fan organs of crayfish enhance chemical information flow, 150
FARMER, MARK A., WILLIAM K. FITT, AND ROBERT K. TRENCH, Morphology of the symbiosis between *Corculum cardissa* (Mollusca:Bivalvia) and *Symbiodinium corculorum* (Dinophyceae), 336
Favia, 118
FUJIWARA, Y., see S. Kojima , 298
Finlets, 9
FITT, WILLIAM K., see Mark A. Farmer, 336
Flagellated cell, 20
Flexibility, 1
Flexural and torsional stiffness in multi-jointed biological beams, 1
Flow field, 150
Fluid mechanics, 160
FRASER, PETER J., Statocysts in crabs: short-term control of locomotion and long-term monitoring of hydrostatic pressure, 155
FUJIKURA, K., see S. Kojima, 298
Function and functional groupings of the complex mouth apparatus of the squat lobsters *Munida sarsi* Huus and *M. tenuimana* G. O. Sars (Crustacea: Decapoda), 281
Functional morphology, 281

G

GARM, A., AND J. T. HØEG, Function and functional groupings of the complex mouth apparatus of the squat lobsters *Munida sarsi* Huus and *M. tenuimana* G. O. Sars (Crustacea: Decapoda), 281
Gastropod, 257
Gecarcoidea, 305, 321
Gene expression, 247
GFP, 252
Giant clam, 336
Gill
  geometry, 77
  muscle, 77
GRASSO, FRANK W., Invertebrate-inspired sensory-motor systems and autonomous, olfactory-guided exploration, 160
GRASSO, FRANK W., see Diana E. J. Blazis, 147
Green fluorescent protein, 252

H

HADFIELD, MICHAEL G., see Carole S. Hickman, 257
HASHIMOTO, J., see S. Kojima, 298
Hearing, 190
Hemocyanin, cephalopod, 67
HICKMAN, CAROLE S., AND MICHAEL G. HADFIELD, Larval muscle contraction fails to produce torsion in a trochoidean gastropod, 257
HIF-1, 247
HIGGINS, CHARLES M., Sensory architectures for biologically inspired autonomous robotics, 243
HITT, JAMES M., see Robert B. Barlow, 169
HØEG, J. T., see A. Garm, 281
Honeybee, 216
HORI, ISAO, see Shigetoyo Amano, 20
HUBBARD, ALLYN E., see David C. Mountain, 227
Hybridization, 97
Hybrids of two closely related tropical sea urchins (Genus *Echinometra*): evidence against postzygotic isolating mechanisms, 97
Hydrostatic pressure sensing, 155
Hydrothermal vent, 298
5-Hydroxytryptamine, 344
5-Hydroxytryptamine stimulates net Ca^{2+} flux in the ventricular muscle of a mollusc *(Busycon canaliculatum)* during cardioexcitation, 344
Hypoxia, 247
Hypoxia-inducible factor, 247

I

Immunocytochemistry, 127
Increasing sensor flexibility through neuromodulation, 206
Innovative biomechanics for directional hearing in small flies, 190
Insect flight, 216
Insights for robotic design from studies of the control of abdominal position in crayfish, 201
Internal transcribed spacer one, 92
Interspecific relationships between egg size and the level of parental investment per offspring in echinoderms, 33
Invertebrate sensory information processing: implications for biologically inspired autonomous systems, a workshop, 145
Invertebrate-inspired sensory-motor systems and autonomous, olfactory-guided exploration, 160
ISHIDA, H., T. NAKAMOTO, T. MORIIZUMI, T. KIKAS, AND J. JANATA, Plume-tracking robots: a new application of chemical sensors, 222
ISIP-BIAS Symposium, 145
ITS-1, 92

J

JACOBS, DAVID K., see Michael N. Dawson, 92
JANATA, J., see H. Ishida, 222
Jellyfish, 92

K

KATSUYAMA, Y., see T. Okada, 252
KEMPF, STEPHEN C., see Timothy S. Wakefield, 127
KIKAS, T., see H. Ishida, 222
Killifish, 247
KINDERMANN, THOMAS, see Josef Schmitz, 195
Kinematics, 9
KINZIE, ROBERT A., III, MICHELLE TAKAYAMA, SCOTT R. SANTOS, AND MARY ALICE COFFROTH, The adaptive bleaching hypothesis: experimental tests of critical assumptions, 51
KOJIMA, S., R. SEGAWA, Y. FIJIWARA, K. FUJIKURA, S. OHTA, AND J. HASHIMOTO, Phylogeny of hydrothermal-vent–endemic gastropods, *Alviniconcha* spp., from the Western Pacific revealed by mitochondrial DNA sequences, 298

L

Lactate dehydrogenase, 247
Land crab, 305, 321
Landing, 216
Landing strategies in honeybees and possible applications to autonomous airborne vehicles, 216
Larva, 20, 87, 257
Larval collector, 87
Larval muscle contraction fails to produce torsion in a trochoidean gastropod, 257
LAUDER, GEORGE V., see Jennifer C. Nauen, 9
LEVY, O., L. MIZRAHI, N. E. CHADWICK-FURMAN, AND Y. ACHITUV, Factors controlling the expansion behavior of *Favia favus* (Cnidaria: Scleractinia): effects of light, flow, and planktonic prey, 118
Life history, 33
Limulus, 169
Limulus vision in the marine environment, 169
Load compensation feedback control loops, 201
Lobster, 211
Locomotion, 9, 195
  central control of, 155
Lolliguncula brevis, 59

M

MACISAAC, S. STANLEY, see T. Okada, 252
MACMILLAN, DAVID L., AND BLAIR W. PATULLO, Insights for robotic design from studies of the control of abdominal position in crayfish, 201
Macro-video, 281
MARSHALL, JUSTIN, see Thomas W. Cronin, 177
Mating behavior, 169
MCEDWARD, L. R., AND K. H. MORGAN, Interspecific relationships between egg size and the level of parental investment per offspring in echinoderms, 33
MEDLER, SCOTT, AND HAROLD SILVERMAN, Muscular alteration of gill geometry *in vitro:* implications for bivalve pumping processes, 77
MEINERTZHAGEN, I. A., see T. Okada, 252
Metabolic status and respiratory physiology of *Gecarcoidea natalis*, the Christmas Island red crab, during the annual breeding migration, 321
Metamorphosis, 20, 87
Metamorphosis of coeloblastula performed by multipotential larval flagellated cells in the calcareous sponge *Leucosolenia laxa*, 20
Microphone technology, 190
Microsatellite DNA, 261
Migration, 305, 321
Mitochondrial DNA, 298
MIZRAHI, L., see O. Levy, 118
Modeling, 195
Molecular evidence for cryptic species of *Aurelia aurita* (Cnidaria, Scyphozoa), 92
Molecular phylogeny, 298
Mollusca, 261, 336, 344
MORGAN, K. H., see L. R. McEdward, 33
MORIIZUMI, T., see H. Ishida, 222
Morphogenesis, 257
Morphology, functional, 281
Morphology of the symbiosis between *Corculum cardissa* (Mollusca: Bivalvia) and *Symbiodinium corculorum* (Dinophyceae), 336
MORRIS, STEPHEN, see Agnieszka M. Adamczewska, 305, 321
MOSS, CLAIRE, see Amy-Jane Beer, 268
Motor
  control, 195
  neuron, 252
MOUNTAIN, DAVID C., AND ALLYN E. HUBBARD, Sensing scenes with silicon, 227
Mouthparts, 281
Multiple paternity in *Littorina obtusata* (Gastropoda, Littorinidae) revealed by microsatellite analyses, 261
Munida
  sarsi, 281
  tenuimana, 281
Muscle
  circular, 59
  gill, 77
  receptor organ, 201
  smooth, 77
Muscular alteration of gill geometry *in vitro:* implications for bivalve pumping processes, 77

N

NAKAMOTO, T., see H. Ishida, 222
NAUEN, JENNIFER C., AND GEORGE V. LAUDER, Three-dimensional analysis of finlet kinematics in the chub mackerel *(Scomber japonicus)*, 9
Navigation, 216
Nervous system, 160
  stomatogastric, 206
Neural code, 169
Neurobiology, 268
Neuromodulation, 206
Neuromorphic, 243
Neuronal form in the central nervous system of the tadpole larva of the ascidian *Ciona intestinalis*, 252

O

OHTA, S., see S. Kojima, 298
OKADA, T., S. STANLEY MACISAAC, Y. KATSUYAMA, Y. OKAMURA, AND I. A. MEINERTZHAGEN, Neuronal form in the central nervous system of the tadpole larva of the ascidian *Ciona intestinalis*, 252
Okamura, Y., see T. Okada, 252
Olfaction, 150, 160, 211, 227
Optic flow, 216
Optomotor, 184
Orientation, chemical, 150
Oxygen, 247
  transport, 67

P

Panulirus, 211
Parallel processing and image analysis in the eyes of mantis shrimps, 177
PARTRIDGE, VANESSA, see Ian G. Paterson, 261
PATERSON, IAN G., VANESSA PARTRIDGE, AND JOHN BUCKLAND-NICKS, Multiple paternity in *Littorina obtusata* (Gastropoda, Littorinidae) revealed by microsatellite analyses, 261
PATULLO, BLAIR W., see David L. Macmillan, 201
PEARSE, JOHN S., see M. Aminur Rahman, 97
Peptide, 87
Perception, 211
PERNET, BRUNO, Escape hatches for the clonal offspring of serpulid polychaetes, 107
Phonotaxis, 184
Phylogeny of hydrothermal-vent–endemic gastropods, *Alviniconcha* spp., from the Western Pacific revealed by mitochondrial DNA sequences, 298
Physiology, 321
Plume-tracking robots: a new application of chemical sensors, 222
Polyandry, 261
Polychaeta, 107
PÖRTNER, H. O., see S. Zielinski, 67
Position control, 201
Procambarus clarkii, 150

R

RAHMAN, M. AMINUR, TSUYOSHI UEHARA, AND JOHN S. PEARSE, Hybrids of two closely related tropical sea urchins (Genus *Echinometra*): evidence against postzygotic isolating mechanisms, 97
Redundancy, 211

REES, BERNARD B., JOHN A. L. BOWMAN, AND PATRICIA M. SCHULTE, Structure and sequence conservation of a putative hypoxia response element in the lactate dehydrogenase-B gene of *Fundulus*, 247
Representation, 184
Reproduction, asexual, 107
ROBERT, DANIEL, Innovative biomechanics for directional hearing in small flies, 190
Robot, 184, 206, 222
Robotics, 160, 216, 243
Role of aerobic and anaerobic circular mantle muscle fibers in swimming squid: electromyography, 59

S

SANTOS, SCOTT R., see Robert A. Kinzie III, 51
SARTORIS, F. J., see S. Zielinski, 67
Scene analysis, 227
SCHMITZ, JOSEF, JEFFREY DEAN, THOMAS KINDERMANN, MICHAEL SCHUMM, AND HOLK CRUSE, A biologically inspired controller for hexapod walking: simple solutions by exploiting physical properties, 195
SCHULTE, PATRICIA M., see Bernard B. Rees, 247
SCHUMM, MICHAEL, see Josef Schmitz, 195
Scombrid fishes, 9
SEGAWA, R., see S. Kojima, 298
Senses, chemical, 211
Sensing scenes with silicon, 227
Sensor, 206
  artificial, 177
  chemical, 222
Sensory, 211
Sensory architectures for biologically inspired autonomous robotics, 243
Sensory-motor feedback, 201
Serial EM, 252
Setae, 281
Settlement, 87
Sibling species, 92
Silicon, 227
SILVERMAN, HAROLD, see Scott Medler, 77
Smooth muscle, 77
Sperm
  competition, 261
  storage, 261
Sponge, calcareous, 20
Squid, 59
SRINIVASAN, MANDYAM V., SHAOWU ZHANG, AND JAVAAN S. CHAHL, Landing strategies in honeybees and possible applications to autonomous airborne vehicles, 216
Statocysts in crabs: short-term control of locomotion and long-term monitoring of hydrostatic pressure, 155
STEULLET, PASCAL, see Charles D. Derby, 211
Stick insect, 195
Stiffness
  flexural, 1
  torsional, 1
Stomatogastric nervous system, 206
Stomatopod crustacean, 177
Stretch receptor, 206
Structure and sequence conservation of a putative hypoxia response element in the lactate dehydrogenase-B gene of *Fundulus*, 247
Symbiodinium
  bermudense, 127
  corculorum, 336
Symbiosis, 127, 336

T

TAKAYAMA, MICHELLE, see Robert A. Kinzie III, 51
Temperature, 67
Temperature effects on hemocyanin oxygen binding in an Antarctic cephalopod, 67
THORNDYKE, MICHAEL, see Amy-Jane Beer, 268
Three-dimensional analysis of finlet kinematics in the chub mackerel *(Scomber japonicus)*, 9
Torsion, 257
TRENCH, ROBERT K., see Mark A. Farmer, 336
Tube growth, 107
Turbulence, 160

U

UEHARA, TSUYOSHI, see M. Aminur Rahman, 97
Ultrastructure, 336
Urchin, 97
Urochordate, 252

V

Vector coding in the nervous system, 155
Veliger, 257
View from the boundary, 184
Vision, 169, 216, 227
  chip, 243
  color, 177
Visual ecology, 177
VLSI, 227, 243

W

WAKEFIELD, TIMOTHY S., AND STEPHEN C. KEMPF, Development of host- and symbiont-specific monoclonal antibodies and confirmation of the origin of the symbiosome membrane in a cnidarian–dinoflagellate symbiosis, 127
Water pumping, 77
WEBB, BARBARA, View from the boundary, 184
Western Pacific, 298
Why do animals have so many receptors? The role of multiple chemosensors in animal perception, 211

Z

ZHANG, SHAOWU, see Mandyam V. Srinivasan, 216
ZIELINSKI, S., F. J. SARTORIS, AND H. O. PÖRTNER, Temperature effects on hemocyanin oxygen binding in an Antarctic cephalopod, 67
ZIMMER, RICHARD K., see Kenneth A. Browne, 87
Zooxanthellae, 51, 118, 336